

WHAT IS CLAIMED IS:

1. An image processing method comprising:

an image data conversion step (S1111) of

generating an encoding parameter and a series of

5 orthogonal transformation coefficient sequences from
input source image data;

a header information processing step of forming
header information to be contained in an encoded data
stream on the basis of the encoding parameter;

10 a variable-length code encoding step of
generating image information consisting of a series of
a plurality of variable-length codes to be contained in
the encoded data stream by sequentially encoding the
series of orthogonal transformation coefficient
15 sequences;

an instruction step of issuing an operation start
command of an encoding process for the series of the
plurality of variable-length codes from said header
information processing step to said variable-length
20 code encoding step;

a first control step of controlling said header
information processing step to enter an operation
inactive state at an predetermined timing after the
operation start command of the encoding process was
25 issued;

a notification step of sending an operation end
message of the encoding process for the series of

orthogonal transformation coefficient sequences from
said variable-length code encoding step to said header
information processing step; and

 a second control step of controlling said header
5 information processing step in the operation inactive
state to resume an active state in response to the
operation end message of the encoding process.

2. The method according to claim 1, wherein said
first control step controls said header information
10 processing step to proceed to execute an operation
without entering the operation inactive state when the
operation end message of the encoding process is
reached before said header information processing step
enters the operation inactive state.

15 3. The method according to claim 1, wherein when
said header information processing step is in the
operation inactive state, internal state machines of
said header information processing step are deactivated,
and external clock supply is stopped.

20 4. An image processing method comprising:
a header information processing step of obtaining
an encoding parameter by analyzing header information
of an input encoded data stream;

 a variable-length code decoding step of obtaining
25 a series of orthogonal transformation coefficient
sequences as a processing unit by sequentially decoding
image information consisting of a series of a plurality

of variable-length codes in the input encoded data stream;

an image data reconstruction step of reconstructing image data using the encoding parameter
5 and the series of orthogonal transformation coefficient sequences;

an instruction step of issuing an operation start command of a decoding process for the series of the plurality of variable-length codes from said header
10 information processing step to said variable-length code decoding step;

a first control step of controlling said header information processing step to enter an operation inactive state at an predetermined timing after the
15 operation start command of the decoding process was issued;

a notification step of sending an operation end message of the decoding process for the series of orthogonal transformation coefficient sequences as a
20 processing unit from said variable-length code decoding step to said header information processing step; and

a second control step of controlling said header information processing step in the operation inactive state to resume an active state in response to the
25 operation end message of the decoding process.

5. The method according to claim 4, wherein said first control step controls said header information

step to proceed to execute an operation without entering the operation inactive state when the operation end message of the decoding process has reached before said header information step enters the operation inactive state.

6. The method according to claim 4, wherein when said header information processing step is in the operation inactive state, internal state machines of said header information processing step are deactivated, and external clock supply is stopped.

7. A computer readable information storage medium which stores an image processing program that causes a computer to execute an image process and comprises:

a code of an image data conversion step of generating an encoding parameter and a series of orthogonal transformation coefficient sequences from input source image data;

a code of a header information processing step of forming header information to be contained in an encoded data stream on the basis of the encoding parameter;

a code of a variable-length code encoding step of generating image information consisting of a series of a plurality of variable-length codes to be contained in the encoded data stream by sequentially encoding the

series of orthogonal transformation coefficient sequences;

1 a code of an instruction step of issuing an operation start command of an encoding process for the series of the plurality of variable-length codes from said header information processing step to said variable-length code encoding step;

10 a code of a first control step of controlling said header information processing step to an operation inactive state at an predetermined timing after the operation start command of the encoding process was issued;

15 a code of a notification step of sending an operation end message of the encoding process for the series of orthogonal transformation coefficient sequences from said variable-length code encoding step to said header information processing step; and

20 a code of a second control step of controlling said header information processing step in the operation inactive state to resume an active state in response to the operation end message of the encoding process.

8. The medium according to claim 7, wherein said image processing program further comprises a code of a step of proceeding to execute an operation without entering the operation inactive state when the operation end message of the encoding process has

reached before said first control step controls said header information step to enter the operation inactive state.

9. A computer readable information storage medium
5 which stores an image processing program that makes a computer execute an image process and comprises:

a code of a header information processing step of obtaining an encoding parameter by analyzing header information of an input encoded data stream;

- 10 a code of a variable-length code decoding step of obtaining a series of orthogonal transformation coefficient sequences as a processing unit by sequentially decoding image information consisting of a series of a plurality of variable-length codes in the
15 input encoded data stream;

a code of an image data reconstruction step of reconstructing image data on the basis of the encoding parameter and the series of orthogonal transformation coefficient sequences;

- 20 a code of an instruction step of issuing an operation start command of a decoding process for the series of the plurality of variable-length codes from said header information processing step to said variable-length code decoding step;

- 25 a code of a first control step of controlling said header information processing step to an operation inactive state at an predetermined timing after the

operation start command of the decoding process was issued;

1 a code of a notification step of sending an operation end message of the decoding process for the series of orthogonal transformation coefficient sequences as a processing unit from said variable-length code decoding step to said header information processing step; and

10 a code of a second control step of controlling said header information processing step in the operation inactive state to resume an active state in response to the operation end message of the decoding process.

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10. The medium according to claim 9, wherein said
15 image processing program further comprises a code of a step of proceeding to execute an operation without entering the operation inactive state when the operation end message of the decoding process has reached before said first control step controls said
20 header information step to enter the operation inactive state.

11. An image processing apparatus comprising:
an image data converter for generating an encoding parameter and a series of orthogonal
25 transformation coefficient sequences from input source image data;

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a header information processor for forming header information to be contained in an encoded data stream on the basis of the encoding parameter;

a variable-length code encoder for generating
5 image information consisting of a series of a plurality of variable-length codes to be contained in the encoded data stream by sequentially encoding the series of orthogonal transformation coefficient sequences;

an instruction signal for issuing an operation
10 start command of an encoding process for the series of the plurality of variable-length codes from said header information processor to said variable-length code encoder;

a first controller for controlling said header
15 information processor to enter an operation inactive state at an predetermined timing after the operation start command of the encoding process was issued;

a notification signal for sending an operation
20 end message of the encoding process for the series of orthogonal transformation coefficient sequences from the variable-length code encoder to said header information processor; and

a second controller for controlling said header
information processor in the operation inactive state
25 to resume an active state in response to the operation end message of the encoding process.

12. The apparatus according to claim 11, wherein when the operation end message of the encoding process is reached before said first controller controls said header information processor to enter the operation
- 5 inactive state, said first controller controls said header information processor to proceed to execute an operation without entering the operation inactive state.
13. The apparatus according to claim 11, wherein when said header information processor is in the operation
- 10 inactive state, internal state machines of said header information processor are deactivated, and external clock supply is stopped.
14. An image processing apparatus comprising:
- 15 a header information processor for obtaining an encoding parameter by analyzing header information of an input encoded data stream;
- a variable-length code decoder for obtaining a series of orthogonal transformation coefficient sequences as a processing unit by sequentially decoding
- 20 image information consisting of a series of a plurality of variable-length codes in the input encoded data stream;
- an image data reconstruction unit for reconstructing image data on the basis of the encoding
- 25 parameter and the series of orthogonal transformation coefficient sequences;

an instruction signal for issuing an operation start command of a decoding process for the series of the plurality of variable-length codes from said header information processor to said variable-length code
5 decoder;

a first controller for controlling said header information processor to enter an operation inactive state at an predetermined timing after the operation start command of the decoding process was issued;

10 a notification signal for sending an operation end message of the decoding process for the series of orthogonal transformation coefficient sequences as a processing unit from said variable-length code decoder to said header information processor; and

15 a second controller for controlling said header information processor in the operation inactive state to resume an active state in response to the operation end message of the decoding process.

15. The apparatus according to claim 14, wherein when
20 the operation end message of the decoding process has been reached before said first controller controls said header information processor to enter the operation inactive state, said first controller controls said header information processor to proceed to execute an
25 operation without entering the operation inactive state.

16. The apparatus according to claim 14, wherein when said header information processor is in the operation

inactive state, internal state machines of said header information processor are deactivated, and external clock supply is stopped.

17. An image processing apparatus comprising:

5 an image data converter for generating an encoding parameter and a series of orthogonal transformation coefficient sequences from input source image data;

10 a header information processor for forming header information to be contained in an encoded data stream on the basis of the encoding parameter;

15 a variable-length code encoder for generating image information consisting of a series of a plurality of variable-length codes to be contained in the encoded data stream by sequentially encoding the series of orthogonal transformation coefficient sequences;

 a storage device shared by said header information processor and said variable-length code encoder; and

20 an address input permission signal for controlling to grant permission of an address input to said storage device to one of said header information processor and said variable-length code encoder.

18. The apparatus according to claim 17, wherein said
25 storage device is used as a work area of said header information processor and as a storage area of a

variable-length code table which is looked up by said variable-length code encoder.

19. The apparatus according to claim 17, further comprising:

5 an instruction signal for issuing an operation start command of an encoding process for the series of the plurality of variable-length codes from said header information processor to said variable-length code encoder;

10 a notification signal for sending an operation end message of the encoding process for the series of orthogonal transformation coefficient sequences from said variable-length code encoder to said header information processor;

15 a first controller for controlling said header information processor to enter an operation inactive state at an predetermined timing after the operation start command of the encoding process was issued; and
 a second controller for controlling said header
20 information processor in the operation inactive state to resume an active state in response to the operation end message of the encoding process.

20. An image processing apparatus comprising:

 a header information processor for obtaining an
25 encoding parameter by analyzing header information of an input encoded data stream;

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a variable-length code decoder for obtaining a series of orthogonal transformation coefficient sequences as a processing unit by sequentially decoding image information consisting of a series of a plurality of variable-length codes in the input encoded data stream;

an image data reconstruction unit for reconstructing image data on the basis of the encoding parameter and the series of orthogonal transformation coefficient sequences;

a storage device shared by said header information processor and said variable-length code decoder; and

an address input permission signal for controlling to grant permission of an address input to said storage device to one of said header information processor and said variable-length code decoder.

21. The apparatus according to claim 20, wherein said storage device is used as a work area of said header information processor and as a storage area of a variable-length code table which is looked up by said variable-length code decoder.

22. The apparatus according to claim 20, further comprising:

- 25 an instruction signal for issuing an operation start command of a decoding process for the series of the plurality of variable-length codes from said header

information processor to said variable-length code decoder;

an notification signal for sending an operation end message of the decoding process for the series of
5 orthogonal transformation coefficient sequences as a processing unit from said variable-length code decoder to said header information processor;

a first controller for controlling said header information processor to enter an operation inactive
10 state at an predetermined timing after the operation start command of the decoding process was issued; and

a second controller for controlling said header information processor in the operation inactive state to resume an active state in response to the operation
15 end message of the decoding process.

23. An image processing method comprising:

an image data conversion step of generating an encoding parameter and a series of orthogonal transformation coefficient sequences from input source
20 image data;

a header information processing step of forming header information to be contained in an encoded data stream on the basis of the encoding parameter;

a variable-length code encoding step of
25 generating image information consisting of a series of a plurality of variable-length codes to be contained in the encoded data stream by sequentially encoding the

series of orthogonal transformation coefficient sequences;

a first address input step of inputting address information to a storage device in said header

5 information processing step;

a second address input step of inputting address information to the storage device in said variable-length code encoding step; and

an address information selection step of
10 selecting the address information input in one of the first and second address input steps, and allowing to input the selected address information to the storage device.

24. The method according to claim 23, wherein the
15 storage device is used as a work area in said header information processing step and as a storage area of a variable-length code table which is looked up in said variable-length code encoding step.

25. An image processing method comprising:

20 a header information processing step of obtaining an encoding parameter by analyzing header information of an input encoded data stream;

a variable-length code decoding step of obtaining a series of orthogonal transformation coefficient
25 sequences as a processing unit by sequentially decoding image information consisting of a series of a plurality

of variable-length codes in the input encoded data stream;

an image data reconstruction step of reconstructing image data on the basis of the encoding
5 parameter and the series of orthogonal transformation coefficient sequences;

a first address input step of inputting address information to a storage device in said header information processing step;

10 a second address input step of inputting address information to the storage device in said variable-length code decoding step; and

an address information selection step of selecting the address information input in one of the
15 first and second address input steps, and allowing to input the selected address information to the storage device.

26. The method according to claim 25, wherein the storage device is used as a work area in said header
20 information processing step and as a storage area of a variable-length code table which is looked up in said variable-length code decoding step.

27. A computer readable information storage medium which stores an image processing program that
- 25 makes a computer execute an image information generation process and comprises:

a code of an image data conversion step of generating an encoding parameter and a series of orthogonal transformation coefficient sequences from input source image data;

- 5 a code of a header information processing step of forming header information to be contained in an encoded data stream on the basis of the encoding parameter;

- 10 a code of a variable-length code encoding step of generating image information consisting of a series of a plurality of variable-length codes to be contained in the encoded data stream by sequentially encoding the series of orthogonal transformation coefficient sequences;

- 15 a code of a first address input step of inputting address information to a storage device in said header information processing step;

- a code of a second address input step of inputting address information to the storage device in
20 said variable-length code encoding step; and

- a code of an address information selection step of selecting the address information input in one of the first and second address input steps, and allowing to input the selected address information to the
25 storage device.

28. A computer readable information storage medium which stores an image processing program that

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makes a computer execute an image data reconstruction process and comprises:

a code of a header information processing step of obtaining an encoding parameter by analyzing header
5 information of an input encoded data stream;

a code of a variable-length code decoding step of obtaining a series of orthogonal transformation coefficient sequences as a processing unit by sequentially decoding image information consisting of a
10 series of a plurality of variable-length codes in the input encoded data stream;

a code of an image data reconstruction step of reconstructing image data on the basis of the encoding parameter and the series of orthogonal transformation
15 coefficient sequences;

a code of a first address input step of inputting address information to a storage device in said header information processing step;

a code of a second address input step of
20 inputting address information to the storage device in said variable-length code decoding step; and

a code of an address information selection step of selecting the address information input in one of the first and second address input steps, and allowing
25 to input the selected address information to the storage device.